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(57) Abstract

A method and apparatus is disclosed for facilitating inter-network message communications within the framework of a cellular telecommunications network. The message center (22) of the cellular network (10) includes functionality for processing received messages and forwarding the received messages between the cellular network and other connected networks (20). Each message handled by the message center includes a destination identifier (40) in the text field (36) of the message which identifies not only the delivery destination (addressee) for the message (44), but also the network over which the message is to be transmitted in order to reach the identified delivery destination (42). In the preferred embodiment of the invention, the message center functionality facilitates inter-network communications among and between a cellular network (10) (using SMS message format transmissions), a conventional telephone network (using facsimile message format transmissions) (20(1)), and a wide or local area network (using e-mail message format transmissions) (20(2) or 20(3)).

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CELLULAR TELEPHONE NETWORK HAVING SHORT MESSAGE SERVICE INTERACTION WITH OTHER NETWORKS

5 BACKGROUND OF THE INVENTION

Technical Field of the Invention

The present invention relates to cellular telephone networks and, in particular, to a cellular telephone network providing for inter-network short message service (SMS) message transmissions.

Description of Related Art

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In accordance with TIA/EIA Interim Standards 41 and 136 hereinafter referred to as the "IS-41 and 136 Specifications"), provision is made for using a short message service (SMS) message to transmit text (i.e., alphanumeric) messages between mobile stations, base stations and mobile switching centers in a cellular telecommunications network. To facilitate this service, the cellular network includes a message center (often located in the mobile switching center itself) to store SMS messages, initiate the transmission of SMS messages to mobile stations and receive SMS messages transmitted from mobile stations. Use of SMS messages is also authorized by the IS-41 and 136 Specifications for the transmission of text messages between two mobile stations over the cellular telecommunications network via the message center (i.e., an intra-network message communication).

Today's society demands access to and communication over, among and between multiple networks such as a local area network (LAN), wide area network (WAN), conventional telephone network and cellular telephone network. While the current IS-41 and 136 Specifications adequately handle the transmission of text messages using SMS message transmissions within the cellular telecommunications network itself, the specifications fail to address the need for text message transmission between the cellular network and other networks (like the conventional telephone network, LAN or WAN) in the form of inter-network communications. The failure of the IS-41 and 136 Specifications to facilitate such inter-network message

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communications comprises a serious drawback to the specifications that has not yet Secretary of the Control of the been addressed by the art or the specification committee. Town to be also be in the first

A crude and inefficient solution to this deficiency, which does however operate responsible to the control of the control of the state of within the current IS-136 Specification boundaries, involves assignment of a human ordine the control of the state of the state of the person of the person of the control of the c operator to the message center to handle the passage of messages between the cellular The state of the s network and various other networks over which communication may be desired. In the age of comments for the state of the same of the s accordance with this solution, when a subscriber initiates an inter-network SMS text And the state of the state of Tel. # 1 2 3 message at a mobile station and transmits the message to the message center, the 31 S human operator then reformats the message for transmission over another network (using a facsimile or e-mail transmission) and attends to the delivery of the message orach teachairtean, aith i cheanaich teachtairte aidt a aith a clui to a third party over that network. Alternatively, when a third party initiates an inter-ស៊ី ស្ត្រីការ ប្រទេសស្ថាស្នា។ នៅ សម្រើប៉ុស្តែការ ។ network message on another network for transmission to the message center, the છે. મામ જ વર્ષે છે. તે કુલ્લા માનુસાઇડ પ્રસ્તિ મન્યા તો હતા. તે પ્રાપ્ત operator then reformats the message for network transmission (using an SMS message transmission) and attends to the delivery of the message to a certain subscriber mobile า และได้ เการาช เราะ และ และเราะนี้สามากราช มีเกียว สามาก station over the cellular network.

There is accordingly a need for a method and system for allowing cellular นางที่ เหลือ เรื่องความสมาชาง เรื่อนกราย เกาะเกรียงได้ ควา subscribers to both initiate and receive inter-network message transmissions without invoking human operator interaction or intervention. In particular, there is a need for an automated system and method for facilitating inter-network message communication between mobile station subscribers on a short message service supported cellular network and users of other networks which may be connected or or has a participated their thereto.

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SUMMARY OF THE INVENTION

The present invention addresses the current inter-network message Ar water of a state of communication limitations presented by the IS-41 and 136 Specifications for cellular telephone networks by including a functionality in the message center of the cellular telecommunications network that facilitates inter-network message communications. cross with a fire should be a built to the With respect to an SMS message originated by a mobile station, the functionality of a e Costyle x 25 Kit a ta Colai (MAC Secondistribution) the message center analyzes the received message to identify both a designated message delivery network and a destination address on that designated network for

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message delivery. The received message is then re-formatted (if necessary) for transmission on the designated network, and forwarded in the proper format to the ar a constant of the identified destination address via the designated network. With respect to a message originated on a network other than the cellular network, the message center analyzes the received message to identify a subscriber mobile station destination on the cellular network for message delivery. The received message is then re-formatted (if radio militare a premia premia premia di la distribucción de marcina de constitución de la constitución de la d necessary) for transmission on the cellular network, and forwarded in the SMS HE East the thirth terms for all a constitute middless the best and message format to the identified subscriber mobile station via the cellular network.

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In order for the message center to identify the desired network and addressee TRANSPORT SELECTION OF SERVICE destination for delivery of the received message, a destination identifier is added to the House the comment of wife each agreement. text field of the originated message. The destination identifier includes both a network a trade o ever ke delegativate, where each of r designation (identifying the network over which the received message is to be transmitted) and a destination address (identifying the addressee on the designated Commercial registration in a section of registration of the committee of t network to which the received message is to be delivered). For example, a message अनुसुद्धान प्राच्यापाल । १ - १ क्रिन स्ट्रांट को १ के तुम्म मीच्या होता है है। ते क्या द्वारा महिल्ल originated by a mobile station and intended for facsimile delivery to a certain person ta mean calaitaman will include a destination identifier in the text field comprising a network designation and rails for the traction to the first and as less as in justice to be of a conventional telephone network and a destination address of that certain person's construction are existed priority in the many the facsimile telephone number on the telephone network. Similarly, a message originated er a pada ji esperita wa mini Tibera makana kezista ka Tinda da ya kikina ji ki by the mobile station and intended for e-mail delivery to a certain user will include a The believe to the destination identifier comprising a network designation of the user's local or wide area network (LAN or WAN) and a destination address of the user's network address on the LAN or WAN. For messages originated outside the cellular network as a facsimile or e-mail and intended for delivery to a cellular subscriber, the text field will include a destination identifier comprising a network designation of the subscriber's cellular network and a destination identifier of the subscriber's mobile station telephone The Charles To number on the cellular network.

1. 6 1. 14. BRIEF DESCRIPTION OF THE DRAWINGS

CONTRACTOR WE CAN SEE A SEC. A more complete understanding of the method and apparatus of the present invention may be had by reference to the following Detailed Description when taken in conjunction with the accompanying Drawings wherein:

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FIGURE 1 is a block diagram of a cellular telecommunications network implementing the inter-network communications functionality of the present invention;

FIGURES 2A-2D illustrate message formats for transmitting inter-network messages in accordance with the present invention; and

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FIGURE 3 is a flow diagram illustrating operation of the present invention for handling an inter-network message received in one of the formats of FIGURES 2A-2D.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGURE 1, there is shown a block diagram of a cellular 天式15. (4) 11. (5) (2) (3) telecommunications network 10 implementing the inter-network message មានស្រាស់ មានស្រាធិនានេះ 🗓 communications functionality of the present invention. Included in the cellular s eleberations it deveces and network 10 are a plurality of mobile stations 12 and base stations 14 that engage in 可以的标准的 证据,为他的约束是一个一个时间 radio-frequency communications with each other. The mobile stations 12 roam throughout a service area which is divided into a plurality of cells 16 wherein each cell is served by one of the plurality of included network base stations 14. The network 10 further includes a mobile switching center (MSC) 18 connected by a radio-ាំ នូកត្រីឈាម frequency or hard wired communications link to each of the base stations 14 in the service area. The cellular network 10 is further connected via the mobile switching center 18 to a number of other non-cellular networks 20 including a conventional telephone network (like a PSTN) 20(1), a local area network (LAN) 20(2), and a wide area network (WAN) 20(3). For a LAN or WAN connection, the mobile switching center 18 preferably comprises either a node on the network or, alternatively, accesses a network node via the telephone network 20(1) as illustrated by the broken line extending between the telephone network and WAN 20(3).

The mobile switching center 18 includes a message center (MC) 22, a home location register (HLR) 24 and a visitor location register (VLR) 26. It will, of course, be understood that the message center, home location register and visitor location register may be alternatively implemented in stand-alone fashion if desired. The message center 22 receives, stores and forwards short message service (SMS)

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messages, and perhaps other message types, addressed for delivery to and received from the mobile stations 12. The home location register 24 stores permanent data for de terura lea habbitation simul each subscriber that is independent of the current location of the subscriber. The home location register 24 may further store temporary data concerning the address in the CORNEL OF THE SINGLE SERVICE STREET STREET, AND A STREET STREET, AND A STREET STREET, AND A STREET STREET, AND A S message center 22 of any stored short message service messages, and an indication of THE CONTRACTOR OF SECULAR SEC. a message waiting to be delivered to the mobile station. The visitor location register ត្តស្ទី២ ត្រូមីនេះ មានស្ថិត អន្តរបស់ ស្រុក នេះ។ សមត្ថិស 26 stores current data for each subscriber including the current or most recently known The things in the same of the same is the location of the mobile station 12 for the subscriber, the on/off status of the mobile station, security parameters, and an indication of a message waiting to be delivered to the mobile station. 300°C 100°C 100°C

The message center 22 is of conventional design and operates as is known in was made in medical Little of Phase with a great the art, but further includes an inter-network communications functionality (ICF) 28 de nabelensagar which facilitates the transmission of messages between the cellular network 10 and the assais e la casa di navioni afo other networks 20 connected thereto at the message center. Using the inter-network anomics with an SI energy which is not to be communications functionality 28, a mobile station 12 can initiate and send a message TOP I I I I SAME BEEN WITH THE TWO ON from the cellular network 10 for delivery in the proper format to a certain the construction are the first of the fi addressee/destination over one of the other non-cellular networks 20. Thus, the mobile There are a property to establish the open of a return station 12 can generate an SMS message that is carried over the cellular network 10, Libertia (gali) di te converted by the functionality 28 in the message center 22, and then delivered as a โรง เจาะที่ ธระทำให้ใหม่ผลมาใหม่หน้า ผู้เราะ facsimile transmission over the conventional telephone network 20(1)or an e-mail expair ments within a law. transmission over the LAN/WAN 20(2/3). Conversely, the functionality 28 allows a third party to initiate and send a message from one of the other non-cellular networks The state of the s 20 for delivery to a certain subscriber mobile station 12 (addressee) over the cellular network 10. In this operation, a user can generate an e-mail message that is carried over the LAN/WAN 20(2/3), converted by the functionality 28 in the message center 22, and then delivered as an SMS message over the cellular network 10. T h e functionality 28 thus operates to convert among and between any of the many different messaging formats supported by the networks 10 and 20 connected to the message center 22. With reference now to FIGURES 2A-2D, there are illustrated several message formats adapted and modified for transmitting inter-network messages in accordance with the present invention.

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With specific reference to FIGURE 2A, there is shown the format for an e-mail-to-SMS message transmission from either a LAN 20(2) or WAN 20(3) user to a subscriber on the cellular network 10. The format of FIGURE 2A comprises three fields: a destination address field 32; a title field 34; and, a text field 36. The destination address field 32 is filled-in by the sender with the network address on the LAN 20(2) or WAN 20(3) for the message center 22 of the cellular network 10. The title field 34 is filled-in with sender selected information not important to the operation of the present invention comprising the title or subject of the e-mail message. The text field 36 includes the alphanumeric text 38 of the message being sent to the subscriber, and also a destination identifier 40 identifying for the functionality 28 of the message center 22 the ultimate destination (addressee) mobile station 12 on the cellular network 10 of the e-mail message.

The shown the format for a finite-to-SMS message of the properties of the state of In FIGURE 2B there is shown the format for a transmission from the conventional telephone network 20(1) to a subscriber on the cellular network 10. Like the e-mail format of FIGURE 2A, the facsimile format of FIGURE 2B includes a destination address field 32 and a text field 36. ក្រុក្ស **គ្រោះ** ស្រុក ស្រុក destination address field 32 in this case is filled-in by the sender with the facsimile A. 50 1 115 telephone number on the telephone network 20(1) for the message center 22 of the cellular network 10. The text field 36 includes the alphanumeric text 38 of the message being sent to the subscriber, and a destination identifier 40 identifying for the functionality 28 of the message center 22 the ultimate destination (addressee) mobile station 12 on cellular network 10 of the facsimile message. It will be understood that facsimile images transmissions (pictures, handwritten text, etc.) to mobile stations are not, at this time, possible. It is only recognizable text (e.g., typewritten) in a facsimile message that may be converted (perhaps through a scanning operation performed by or in association with the functionality 28) to an SMS text message for delivery to the mobile station.

Referring now to FIGURE 2C, there is shown the format for an SMS-to-e-mail message transmission from a cellular subscriber on the cellular network 10 to either a LAN 20(2) or WAN 20(3) uscr. This format includes only a text field 36 comprising the alphanumeric text 38 of the message being sent from the mobile station 12 of the

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cellular subscriber, and a destination identifier 40 identifying for the functionality 28 of the message center 22 the ultimate destination (addressee) on the LAN 20(2) or WAN 20(3) of the e-mail message.

Similarly, with reference to FIGURE 2D, the format of an SMS-to-facsimile Hara J. E. Sales Bost M. M. E. Etc. C. 1984 Million message transmission from a cellular subscriber on the cellular network 10 to the The course of the first of the first and the first of the conventional telephone network 20(1) includes only a text field 36 comprising the លាក់ក្រុងស្រួនស្រែង ស្រែក ស្រែក ស្រែក ស្រែក ស្រែក សេសា alphanumeric text 38 of the message being sent from the mobile station 12 of the ្នាស់ នេសសាស ជាពីលើលាស់ សៅសាស្ស ជា គឺ សេច spranday. cellular subscriber, and a destination identifier 40 identifying for the functionality 28 of the message center 22 the ultimate destination (addressee) on the conventional telephone network 20(1) of the facsimile message. The waste attack and the things in the months of the terms.

In FIGURES 2C and 2D, no destination address field (32 in FIGURES 2A and 2B) identifying the message center 22 as the destination for the SMS message nute algebra a communicación de la compacta de la c transmission is needed because such messages are automatically routed from the mobile station 12 to the message center. azi waka gerengashar sunduri siri kila kelebati da 1900 di 1900

The destination identifier 40 in FIGURES 2A-2D includes both a network TONE TO COME OF THE STATE OF TH designation (identifying the network over which the message is to be transmitted for delivery) 42 and a destination address (identifying the addressee on the designated this time the same of administration is the network to which the message is to be delivered) 44 separated from each other by a colon or other appropriate delimiter (e.g., a hyphen, slash, etc.). In the case of the email and facsimile message formats of FIGURES 2A and 2B for messages generated 差对 海上性病的 煙煙石 福山區鎮區 for initial transmission over one of the other networks 20, the network designation 42 is "SMS" (or any other appropriate designation) identifying the cellular network 10 as the network over which the message is to be transmitted after conversion to an SMS admitted the design message. The destination address 44 of the identifier 40 is "NPA-NXX-XXXX" identifying the telephone number of the subscriber to whom the SMS message is to be delivered. In the case of the e-mail message format of FIGURE 2C, for messages the the contract of the first generated for initial transmission over the cellular network 10, the network designation 42 is "LAN" or "WAN" (or any other appropriate designation) identifying the LAN 20(2) or WAN 20(3), respectively, as the network over which the message is to be transmitted after conversion as an e-mail message. The destination address 44 in the identifier 40 is "xxxxx@yyyyy.zzzzz" identifying the network address of the user to Structure for all other care greater.

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whom the e-mail message is to be delivered. This address may comprise an Internet, world wide web or other network address. With the facsimile message format of FIGURE 2D, for messages generated for initial transmission over the cellular network 10, the network designation 42 is "FAX" (or any other appropriate designation) identifying the conventional telephone network 20(1) as the network over which the message is to be transmitted after conversion as a facsimile message. The destination address 44 in the identifier 40 is "NPA-NXX-XXXX" identifying the facsimile telephone number of the person to whom the facsimile message is to be delivered.

Reference is now made to FIGURE 3 wherein there is shown a flow diagram illustrating operation of the functionality 28 of the message center 22 of the present invention for handling a received inter-network message having one of the formats shown in FIGURES 2A-2D. At step 100, an inter-network message is received by the message center 22 from either the cellular network 10 or other network 20. The received message may comprise a facsimile message or an e-mail message originated in one of the other networks 20 (in one of the formats shown in FIGURES 2A and 2B) and intended for delivery over the cellular network 10 as an SMS message. Alternatively, the received message may comprise an SMS message originated at a mobile station 12 (in one of the formats shown in FIGURES 2C and 2D) and intended for delivery over one of the other networks 20 as a facsimile message or an e-mail message.

Following receipt of the message, the functionality 28 converts the received message. First, analysis of the text field 36 of the message is made to determine in decision step 102 whether a destination identifier 40 has been included. In one embodiment, the destination identifier 40 is found by searching the text field 36 for portions of text surrounded by quotation marks or other appropriate delimiters (e.g., brackets, parenthesis, hyphens, etc.). Alternatively, the destination identifier could be in the first piece of data in the received message (provided the data complies with the format of the destination identifier 40. In the event no destination identifier 40 is found (branch 106), the received message cannot be automatically delivered by the functionality 28, and is instead output in step 104 to a console or printer where human operator assistance is preferably made available on an "as needed" basis to attend to

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message delivery. Once the destination identifier 40 is found (branch 108), the network designation 42 portion of the identifier is read in step 110.

If the read network designation 42 comprises the term "FAX", as in step 112, with editors of a series of early and an the functionality 28 extracts the facsimile telephone number "NPA-NXX-XXXX" er en marchett var a tro fig. 5 from the destination address 44 in step 114. Any re-formatting of the received message (in this case an SMS message) necessary for facsimile transmission is then កុម្មនាជាសាក្រីសាទិសន៍ នាមានប្រទេសស.១១សាសាសន៍ performed in step 116. The conventional telephone network 20(1) is then accessed by the functionality 28 of the message center 22 in step 118 following message conversion, and the received and converted message is delivered as a facsimile 网络黑皮种物 化金属水杨二十二氢甲基磺二二酸酯 message over the accessed network in step 120. HI TO TELEVISION OF A SECOND

If the read network designation 42 instead comprises the term "LAN", as in ें भी देश प्रात्न देशों जानी कहा ने निर्माण प्रतिकामिन प्राप्ति step 122, the functionality 28 extracts the network address "xxxxx@yyyyy.zzzzz" from the destination address 44 in step 124. Any re-formatting of the received ្រោះស្ថិត រត់ ប្រ. ម ភាពស្រាស់ នៅជាប្រើបាន message (in this case an SMS message) necessary for LAN e-mail transmission is then performed in step 126. The LAN 20(2) is then accessed by the functionality 28 of the message center 22 in step 128 following message conversion, and the received and converted message is delivered as an e-mail message over the accessed network in step កក្សាទក្សាររួមសុរស្ត្រីម៉ែន សេសសម្រើរាស់ ស្រុកសម្រេច មាន មាន សេសស

> to a light Edd Pool of the gave to comment with once of the recomment with If the read network designation 42 alternatively comprises the term "WAN", as in step 132, the functionality 28 extracts the network "xxxxx@yyyyy.zzzzzz" from the destination address 44 in step 134. Any re-formatting of the received message (in this case an SMS message) necessary for WAN e-mail transmission is then performed in step 136. The WAN 20(3) is then accessed by the functionality 28 of the message center 22 in step 138 following message conversion, 1.5 the growth search and the received and converted message is delivered as an e-mail message over the 1.50% accessed network in step 140.

If the read network designation 42 instead comprises the term "SMS", as in នាក់ស្ពាល់ស្រាស់ ទៅមកសុខសុខ ការសេខ ក្រើមអំពី២០២០ ខេត្ត step 142, the functionality 28 extracts the subscriber mobile station 12 telephone number "NPA-NXX-XXXX" from the destination address 44 in step 144. Any rethe state of the managers of the state of formatting of the received message (in this case a facsimile or e-mail message) necessary for SMS message transmission is then performed in step 146. The cellular

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network 10 is then accessed by the functionality 28 of the message center 22 in step 148 following message conversion, and the received and converted message is delivered as an SMS message over the accessed network in step 150.

If the read network designation 42 alternatively comprises some other term (branch 152), the received message cannot be automatically delivered by the functionality 28, and is instead output in step 104 to a console or printer where human assistance is preferably made available on an "as needed" basis to attend to message delivery.

Although a preferred embodiment of the method and apparatus of the present invention has been illustrated in the accompanying Drawings and described in the foregoing Detailed Description, it will be understood that the invention is not limited to the embodiment disclosed, but is capable of numerous rearrangements, modifications and substitutions without departing from the spirit of the invention as set forth and defined by the following claims. In particular, it should be noted that although disclosed in connection with operation within one particular type of cellular system, the present invention may be used in any cellular telephone system supporting intra-network textual message delivery.

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WHAT IS CLAIMED IS:

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1. A communications system, comprising:

a cellular communications network comprising a plurality of mobile stations engaging in cellular telephone communications as well as short message service message communications;

a non-cellular communications network for carrying network message

means connected between the cellular and non-cellular communications networks for facilitating inter-network message communications, said means 10 functioning to perform a conversion of short message service messages originated at mobile stations on the cellular network to network messages transmitted for delivery by the non-cellular communications network

- 2. The communications system as in claim 1 wherein the non-cellular to the fiberial translations network comprises a conventional telephone network and the network messages comprise facsimile messages.
 - 3. The communications system as in claim 2 wherein each short message service message originated on the cellular network includes a destination address comprising a facsimile telephone number, the means for facilitating further functioning after short message service message conversion to deliver the converted short message service message as a facsimile message transmitted over the conventional telephone network to the facsimile telephone number identified in the destination address.
 - 4. The communications system as in claim 1 wherein the non-cellular communications network comprises a local area network (LAN) or wide area network (WAN) and the network messages comprise e-mail messages.
 - 30 5. The communications system as in claim 4 wherein each short message service message originated on the cellular network includes a destination address

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comprising a LAN/WAN address, the means for facilitating further operating after short message service message conversion to deliver the converted short message service message communication as an e-mail message transmitted over the LAN or WAN to the LAN/WAN address identified in the destination address.

- 6. The communications system as in claim 1 wherein the non-cellular communications network comprises a plurality of non-cellular communications networks connected to the means for facilitating, and each short message service message originated on the cellular network includes a network designation identifying one of the plurality of non-cellular communications networks over which the short message service message is to be delivered after conversion.
 - 7. The communications system as in claim 6 wherein the means for facilitating further operates after short message service message conversion to forward the network message comprising the converted short message service message to that one of the plurality of non-cellular communications networks identified in the network Desire as in it is a security to the text. designation.
- 8. A message center for a cellular communications network, the cellular communications network supporting the transmission of short message service messages to and from mobile stations, the message center including an inter-network communications functionality facilitating the transmission of messages between the cellular communications network and a non-cellular communications network connected thereto, the non-cellular communications network supporting the 25 transmission of network messages, said functionality operating to convert short message service messages originated at mobile stations to network messages for transmission over the non-cellular communications network.
 - 9. The message center as in claim 8 wherein the non-cellular network 30 comprises a local or wide area network (LAN/WAN) and wherein each short message service message originated on the cellular network includes a destination address

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comprising a LAN/WAN address, the functionality further operating after short message service message conversion to transmit an e-mail message comprising the converted short message service message to the LAN/WAN address.

- The message center as in claim 8 wherein the non-cellular network comprises a conventional telephone network and wherein each short message service message originated on the cellular network includes a destination address comprising a facsimile telephone number, the functionality further operating after short message service message conversion to transmit a facsimile message comprising the converted short message service message to the facsimile telephone number.
- 11. The message center as in claim 8 wherein the non-cellular communications network comprises a plurality of non-cellular communications networks connected to the functionality, and each short message service message originated on the cellular network includes a network designation identifying one of the plurality of non-cellular communications networks over which the converted short message service message is to be transmitted.

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- 12. The message center as in claim 11 wherein the functionality further
 20 operates after short message service message conversion to forward the network
 message comprising the converted short message service message for transmission
 over that one of the plurality of non-cellular communications networks identified in
 the network designation.
 - A method for inter-network message communications, comprising the steps of:

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receiving a short message service message originated at a mobile station of a cellular communications network, said message received at an interconnection point between the cellular communications network and a non-cellular communications network;

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converting the received short message service message for transmission as a network message over the non-cellular communications network, the step of converting including the step of identifying a destination on the non-cellular network for the network message comprising the converted short message service message; and delivering the network message to the identified destination.

- 14. The method as in claim 13 wherein the non-cellular network comprises a conventional telephone network, and the step of converting further includes the step of converting the short message service message to a facsimile message.
 - 15. The method as in claim 14 wherein the short message service message includes a field containing a facsimile telephone number for the destination of the network message, and the step of identifying further includes the step of extracting the facsimile telephone number from the short message service message.

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- 16. The method as in claim 13 wherein the non-cellular network comprises a local or wide area network (LAN/WAN), and the step of converting further includes the step of converting the short message service message to an e-mail message.
- The method as in claim 16 wherein the short message service message includes a field containing a LAN/WAN address for the destination of the network message, and the step of identifying comprises the step of extracting the LAN/WAN address from the short message service message.
- The method as in claim 13 wherein the non-cellular communications network comprises a plurality of non-cellular communications networks, and wherein the short message service message includes a field containing a network designation identifying a certain one of the plurality of non-cellular networks, the step of delivering including the step of transmitting the network message comprising the converted short message service message over the certain one of the plurality of non-cellular networks identified in the network designation.

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A method for inter-network message communications, comprising the steps of: Probability of the table of the Control of the Cont

receiving a network message originated on a non-cellular communications network, said message received at an interconnection point between the non-cellular communications network and a cellular communications network including a plurality of mobile stations;

converting the received network message for transmission as a short message service message over the cellular communications network, the step of converting adaniam veda d including the step of identifying a destination mobile station on the cellular network for delivery of the short message service message comprising the converted network message; and the standard of t

delivering the short message service message to the identified destination or security and a mobile station.

15 The method as in claim 19 wherein the non-cellular network comprises a conventional telephone network, and the step of converting further includes the step of converting the network message comprising a facsimile message to a short message service message.

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- The method as in claim 20 wherein the facsimile message includes a field containing a cellular telephone number for the destination mobile station, and the step of identifying comprises the step of extracting the cellular telephone number from the facsimile message.
- 22. The method as in claim 19 wherein the non-cellular network comprises a local or wide area network (LAN/WAN), and the step of converting further includes the step of converting the network message comprising an e-mail message to a short message service message.
- and the experimental property of the contract The method as in claim 22 wherein the e-mail message includes a field The new plant containing a cellular telephone number for the destination mobile station, and the step

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of identifying comprises the step of extracting the cellular telephone number from the A compared to the engineering e-mail message. the service of the service of the first service and

a light to the many of the state of the A communications system, comprising:

The complete profession of the profession a cellular communications network comprising a plurality of mobile stations ក់ស្ថា ការក្រុមហៀត ក្រុមដ្ឋាភិបាលនេះ សំខាន់ស៊ីនា engaging in cellular telephone communications as well as short message service Contract of the state of message communications;

1.5 Contract the second a non-cellular communications network for carrying network message and the stage of the stage of the stage of communications; and

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grand and interesting the means connected between the cellular and non-cellular communications a a 发生 2000 医高级原理机构。 networks for facilitating inter-network message communications, said means Land Same of the grade of the Both functioning to perform a conversion of network messages originated on the non-THE SAME OF MITTING AND AREA STRAIGHT cellular communications network to short message service messages transmitted for THE THE PARTY OF THE SECRETARY STREET delivery to mobile stations by the cellular communications network. The transfer of the state of th

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are the cliffian is nearly The communications system as in claim 24 wherein the non-cellular The Sparker of the communications network comprises a conventional telephone network and the metable sense with no commen network messages comprise facsimile messages.

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- 15.7 47 20 26. The communications system as in claim 25 wherein each facsimile message originated on the conventional telephone network includes a destination address of a cellular telephone number, the means for facilitating further functioning after network message conversion to deliver the converted facsimile message as a short message service message over the cellular communications network to the 25 cellular telephone number identified in the destination address.
 - 27. The communications system as in claim 24 wherein the non-cellular communications network comprises a local area network (LAN) or wide area network (WAN) and the network messages comprise e-mail messages.

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- 28. The communications system as in claim 27 wherein each e-mail message originated on the LAN/WAN includes a destination address of a cellular telephone number, the means for facilitating further operating after network message conversion to deliver the converted e-mail message as a short message service ing that the first and the second message communication transmitted over the cellular communications network to the The solution than the wife and the highest the site of the cellular telephone number identified in the destination address. so a prosent violente de Carner Paris violante articles de l'experiención de la company
 - A message center for a cellular communications network, the cellular The street of the street of the communications network supporting the transmission of short message service messages to and from mobile stations, the message center including an inter-network communications functionality facilitating the transmission of messages between the ting the state of the control of the fact of the state of the control of the cont cellular communications network and a non-cellular communications network the program of the second of the contract of t connected thereto, the non-cellular communications network supporting the transmission of network messages, said functionality operating to convert network managografica som de engent namele i de de la de la l messages originated on the non-cellular communications network to short message ลของ กระบางพระเอ็ดเด็ด ตัว เปริ่มโดก อย่ากุล การการคาร เป็นได้ service messages for transmission over the cellular communications network and delivery to mobile stations. को, सर्व १८१४ वर्ष भेष्ट भेष्ट हो। हो १८ अस्ति हो। अस्ति हो। अस्ति हो।
 - 30. The message center as in claim 29 wherein each network message รัฐบาร จาก ๒๐ ๒๖ (๑๐๙) และ คนสายาว ฮาวาม เหมือนสายนาว เลาะ สามา (ภาษาสา originated on the non-cellular communications network includes a destination address anneal renter of land of high latter than the return of comprising a cellular telephone number of a certain mobile station, the functionality further operating after network message conversion to transmit a short message service ភាព ដែលមេ ស្រែក ស្រែក ស្រែក ស្រែក ស្រែក ស្រែក ស្រែក ស្រែក ស្រ message comprising the converted network message to the certain mobile station over ation on High States a trade of an in the state of th the cellular network.

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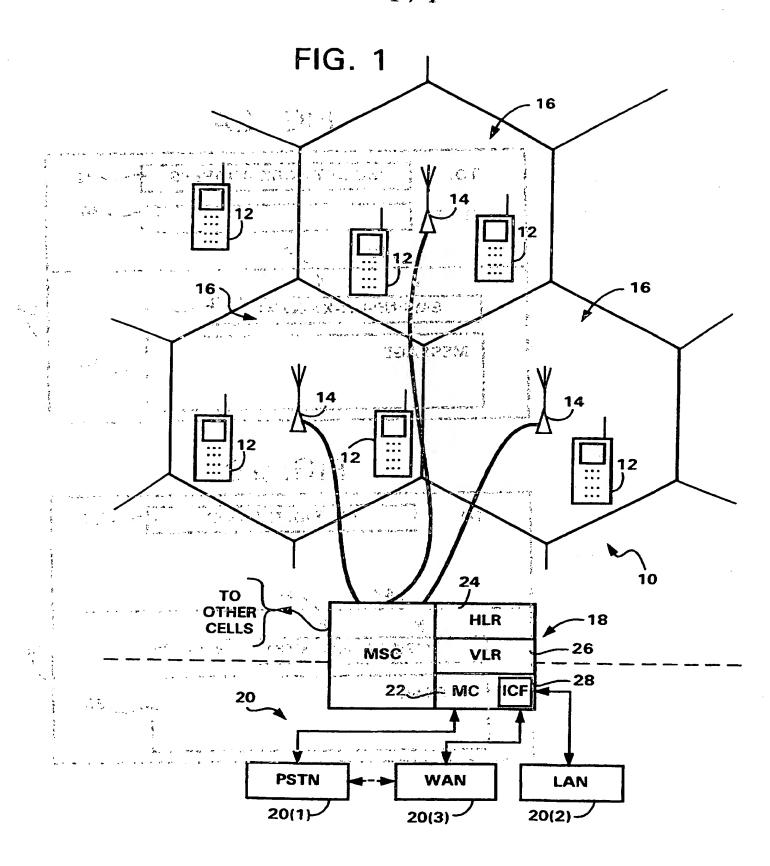
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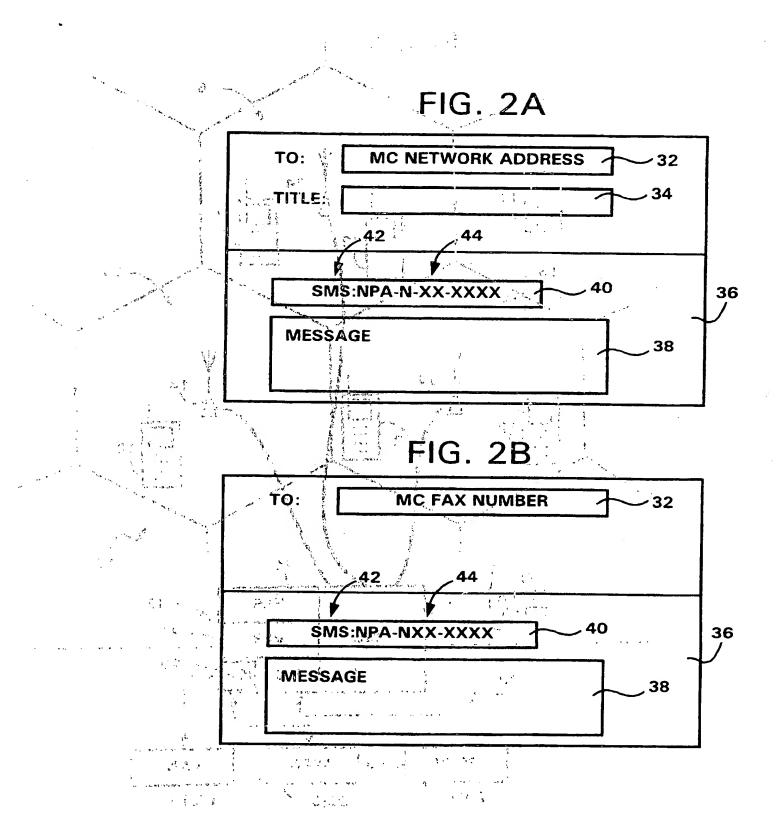
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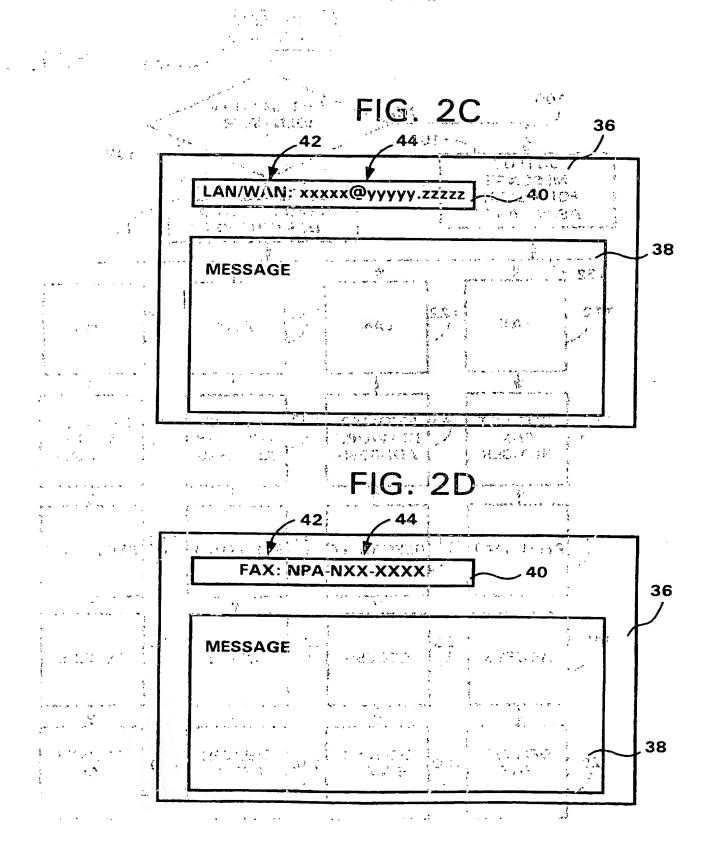
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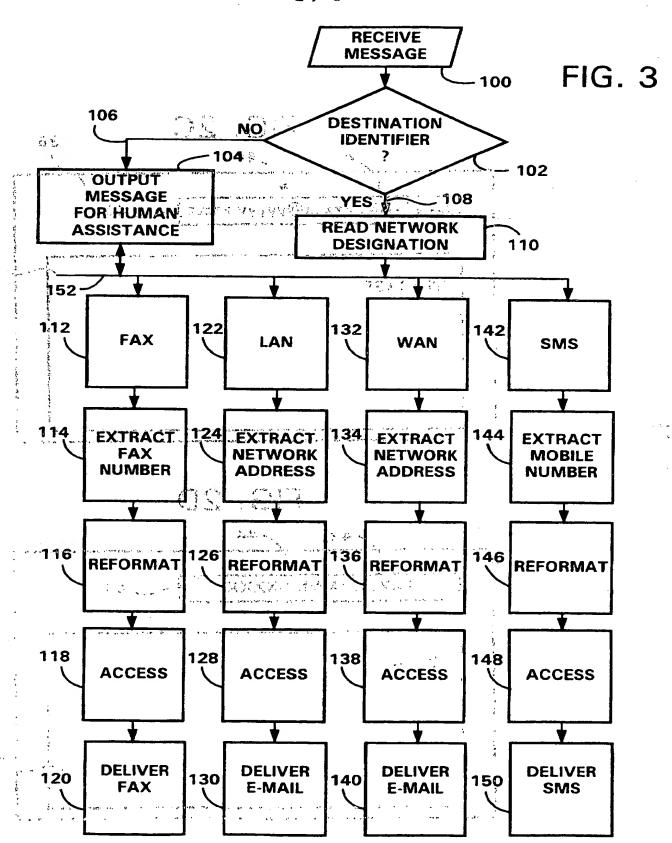


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INTERNATIONAL SEARCH REPORT

Internat J Application No

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